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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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CHRISTOPHER J. ROURK
AKIN, GUMP, STRAUSS, HAUER & FELD, L.L.P.
P O BOX 688
DALLAS, TX 75313-0688

EXAMINER

WERNER, BRIAN P

ART UNIT

PAPER NUMBER

2621

DATE MAILED: 10/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/848,479

Applicant(s)

GUEST ET AL.

Examiner

Brian P. Werner

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 27-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 27-49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This action is response to the arguments received on July 29, 2002. In response to those arguments, the previous claim objection is withdrawn. However, all of the prior art rejections are maintained (refer to the response to arguments section below).

Claims 27-49 remain pending.

Response to Arguments

2. Regarding the previous objection to claim 47, it is noted that applicant has argued that the claimed "area" is intended to be interpreted "to the extent that multiple interpretations are enabled by the specification" and that "all such interpretations are intended to be encompassed by the claims". In response to this clarification, the objection is withdrawn. However, the multiple prior art rejections that cover all such interpretations are therefore all maintained. That is, paragraphs 6 and 8 of the previous Office Action, both of which are prior art rejections of claim 47, are maintained in light of applicant's response.

3. Applicant's arguments filed on July 29, 2002 have been fully considered but they are not persuasive.

Regarding the Sumie and Miyazaki combination, applicant argues that "it is clear from Miyazaki that the histogram is formed from multiple difference images, which requires at least three sets of image data" (response page 7) and that "citations are

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made to [multiple] different embodiments in the Office Action" (response page 7). In response to applicant's assertion that "different embodiments" are relied upon by the examiner, it is noted that applicant has not specified which embodiment of Miyazaki are relied upon as teaching which of the claimed feature. Applicant's allegation of multiple embodiments is broad sweeping, and unsupported by the citation of specific instances. Even if the examiner did rely upon multiple embodiments (which he has not), this practice is not improper per se.; so long as the embodiments relied upon are clearly addressed as specific teachings, relating to specific claimed elements and having specific motivations for the combination. However, the examiner is only relying upon one, specific teaching of Miyazaki that has commonality to each of the disclosed embodiments. This teaching is described at column 15, lines 30-57, with reference to figures 17 and 18. Miyazaki teaches a method of detecting defects from a difference image using a brightness histogram (i.e., figures 17 and 18), where thresholds are individually set in order to provide "pattern defect inspection with high accuracy" (Miyazaki, column 15, line 57). In summary, one teaching is relied upon in the Miyazaki reference, and applicant has been fairly apprised of the nature of the teaching, and the reasons for the combination.

In response to applicant's argument that the Miyazaki histogram is formed from multiple difference images, which requires at least three sets of image data, the examiner disagrees. This is an absolutely incorrect characterization of the Miyazaki reference with respect to the Sumie and Miyazaki combination as advanced in the previous Office Action. While Miyazaki does teach the formation of a plurality of

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difference images from which a plurality of histograms are generated, Miyazaki does not teach a situation where a histogram is generated from more than two images. In addition, the step of forming a plurality of difference images is a step that precedes the teaching relied upon by the examiner, and a step that is not relied upon by the examiner per se. The teaching that is relied upon by the examiner is that which is done to determine defects from a single difference image. In order to detect the presence of a defect in an image of an inspection object, Miyazaki first finds the appropriated reference image to use for comparison (i.e., the "optimum difference image" at Miyazaki column 15, line 7). While Miyazaki does teach a plurality of reference images in order to determine this optimal image, the examiner in the Sumie and Miyazaki combination does not rely upon this teaching. The combination does not concern itself with how Miyazaki determines which reference image to use. That is, the fact that Miyazaki utilizes multiple reference images in order to find an optimal reference image has no bearing on the prior art combination, because the examiner is relying upon a specific teaching of Miyazaki of determining the presence of a defect from a single difference image. While Miyazaki may or may not disclose a number of preceding steps and subsequent steps, those teachings are not what the examiner is relying upon. Following the determining of an optimal difference image, Miyazaki proceeds to determine the presence of a defect on the inspected object from the histogram data contained in the optimal difference image. This is the feature that is relied upon by the examiner. That is, the examiner is relying upon Miyazaki's specific method of detecting a defect in a difference image; as this is what Sumie calls for in the Sumie and Miyazaki

combination. In order to detect the defect, Miyazaki sets a threshold in the brightness histogram of the difference image (a difference between only two images), and detects a defect that corresponds to a brightness peak that exceed the threshold. Stated again, this feature and this feature alone is that which the examiner, in the Sumie and Miyazaki combination, relies upon. Miyazaki's difference image is a difference between only two images: The inspected image and the optimal reference image. The reason that the examiner is relying upon this teaching is that it provides the advantage of automatically and individually setting thresholds in any difference image to account for normal brightness variations, thus facilitation the determination of defects that would otherwise would not be detected in a system with a fixed threshold (i.e., refer to Miyazaki column 15, lines 30-57). **Thus, to sum up the Sumie and Miyazaki combination, Sumie is relied upon as determining a reference image from a difference image where the presence of defects in the difference image are determined, and Miyazaki is relied upon as teaching a specific method of detecting defects from the difference image that provides the aforementioned benefits and advantages. The fact that Miyazaki may or may not describe preceding and subsequent steps is inconsequential to the prior art combination, because the examiner is relying upon Miyazaki for a specific "teaching", and not as the primary reference.**

Applicant states that the Sumie and Miyazaki combination is improper because "Sumie teaches away from the combination with Miyazaki". That is, applicant states that Sumie's image data is in binary from, and therefore "never stored in a form so as to allow it to be converted into a histogram". In response, Sumie does convert the

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difference image into binary data in order to determine defects (i.e., Sumie column 5, line 47). However, Sumie's difference image itself is not binary, and that's why the conversion is necessary. In the Sumie and Miyazaki combination, Miyazaki teach that a histogram can be formed from just such a difference image, in order to accurately detect defects. Sumie's difference image, which is not in binary form, is perfectly suitable for incorporating the teaching of Miyazaki. In the Sumie and Miyazaki combination, Sumie's step of binary conversion to detect defects is replaced by the teaching of Miyazaki in order to provide the aforementioned advantages, and there is not contradiction or a teaching away between the two.

Applicant states that "in order to use the system of Sumie with the system of Miyazaki, the system would need to be modified to store all of the image data, and Sumie notes that such a system would 'disadvantageously [be] required to have a huge memory'" (response page 8). The examiner does not fully understand applicant's point here. However, in an effort to clarify the examiner's position, it is noted that the systems of Sumie and Miyazaki are not being literally combined, or literally used together. Rather, the system of Sumie is being modified according to a specific teaching of Miyazaki as described above and in the previous Office Action. In the combination, Sumie would not be required to store a massive amount of data, as all of the elements and steps of the Miyazaki reference are not performed by Sumie. To reiterate, **Sumie is relied upon as determining a reference image from a difference image where the presence of defects in the difference image are determined, and Miyazaki is**

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relied upon as teaching a specific method of detecting defects from a difference image that provides the aforementioned benefits and advantages.

Applicant argues that both "Sumie and Miyazaki presuppose the existence of a reference image" and "the entire concept of a system or method for selecting a reference die image from two sets of image data is foreign to Sumie and Miyazaki" (response page 9). First, the Miyazaki reference does not even belong in this argument because Miyazaki is not relied upon as teaching the selection of a reference image. Now turning to Sumie, even if Sumie did presuppose the existence of a reference image, there is nothing in the claims that would preclude this pre-supposition as the claims are open ended. The claims only require the comparison of two images to select a reference image and this is exactly what Sumie does, as explained in the previous Office Action. The examiner pointed to very specific areas of the Sumie reference where Sumie teaches the concept of selecting a reference image through the calculation of a difference image, and applicant has not addressed a single one of these citations. Thus, in response to applicant's assertion that "the entire concept of a system or method for selecting a reference die image from two sets of image data is foreign to Sumie", the examiner responds by asserting that the concept is not foreign to Sumie, as described in the previous Office Action.

The remainder of applicant's arguments is drawn to how the additional prior art references (i.e., those added to the Sumie and Miyazaki combination to further teach features of the dependent claims) fail to cure the deficiencies of Sumie and Miyazaki.

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Given that there are not deficiencies in the Sumie and Miyazaki combination as described above, those arguments are moot.

It is noted that applicant has completely overlooked one very critical prior art rejection. In the previous Office Action at paragraph 5, and as repeated herein, all of the independent claims (i.e., claims 27, 33 and 44) are rejected over the combination of Sumie and Brecher. Applicant has not addressed this ground of rejection.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 27-30, 33-37, 40, 41 and 44-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sumie et al. (US 5,943,437 A) and Miyazaki (US 6,031,607 A). The rejection advanced in the previous Office Action is incorporated herein by reference; the details of which will not be repeated.

6. Claims 27, 33 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sumie et al. (US 5,943,437 A) and Brecher et al. (US 5,544,256 A). The rejection advanced in the previous Office Action is incorporated herein by reference; the details of which will not be repeated.

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7. Claims 31, 38, 42 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sumie et al. (US 5,943,437 A) and Miyazaki (US 6,031,607 A) as applied to claims 27, 36, 40 and 44, and further in view of Michael (US 5,640,200 A). The rejection advanced in the previous Office Action is incorporated herein by reference; the details of which will not be repeated.

8. Claims 32, 39, 43, 48 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sumie et al. (US 5,943,437 A) and Miyazaki (US 6,031,607 A) as applied to claims 27, 36, 40 and 44, and further in view of Berezin et al. (US 5,539,752 A). The rejection advanced in the previous Office Action is incorporated herein by reference; the details of which will not be repeated.

9. Claim 31, 32, 38, 39, 42, 43, 47, 48 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sumie et a. (US 5,943,437 A) and Miyazaki (US 6,031,607 A) as applied to claim 44, and further in view of Litt et al. (US 5,091,963 A). The rejection advanced in the previous Office Action is incorporated herein by reference; the details of which will not be repeated.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian P. Werner whose telephone number is 703-306-3037. The examiner can normally be reached on M-F, 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo H. Boudreau can be reached on 703-305-4706. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.

Brian Werner
Patent Examiner
October 16, 2002



**BRIAN WERNER
PATENT EXAMINER
ART UNIT 2621**